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Nili Fossae will probably be the landing place for the Mars Science Laboratory  
NASA / JPL

## [Methane Sources on Mars](#)

*Either an ancient, methane-rich atmosphere or organisms, claim experts*

Although the presence of [methane in Mars' atmosphere](#) has been positively identified more than four years ago by three different sources, its provenience still eludes scientists. On Earth, we have the biomass to blame, namely the decaying plants and animal flatulence, but since none of these exists on Mars, a viable explanation has to be found. A product of some ancient life process, persisting in the atmosphere, is also out of the question, as recent research has demonstrated that methane is quickly decomposed by sunlight and cannot last for more than a few hundred years.

Following the same logic, there must be a constant source of methane on Mars that continuously fills its atmosphere, forming the large methane clouds. Unfortunately, the discoverers of methane (Mars Express spacecraft, the Keck II and Gemini South telescopes, and the Canada-France-Hawaii telescope) couldn't provide more clues as far as its origins were concerned. What was discovered, though, was that the gas did not spread equally, but instead agglomerated in "hotspots," which help in the formation of the massive clouds of hundreds of kilometers that dissipate in just one year's time (much faster than the anticipated 300-600 years).

This means that, since they break down so fast, they should also be generated just as quickly. Nili Fossae (shown in the picture), one of these "hotspots," is actually an eroded crack that has been chinked by materials coming from a neighboring crater. One possible explanation for the formation of methane associates it with the Earth's underground microbes (methanogens) that don't rely on sunlight and oxygen to prosper, but on chemical energy from their environment, which causes them to release methane instead. Perhaps Nili Fossae hides such organisms.

The other possibility remaining involves the existence of methane clathrates (formations of water in solid state, containing large amounts of methane in their crystal structures), which, under the influence of the changing pressure and temperature, steadily emit methane on a small scale. However, according to Caroline Thomas and a team of specialists from the Universite de Franche-Comte in France, such formations could only exist if the atmosphere of the red planet had once contained a large amount of methane (as a result of a comet impact). All these theories will probably be tested by the Mars Science Laboratory rover, scheduled for launch next year.